Section 1. Introduction

The literature on women in science and engineering is extensive and deals with such issues as early education, decisions to study and pursue careers in science, and how women fare in their jobs.

This review used the literature on the careers of women scientists and engineers employed in academia to examine how women in these disciplines fare compared with their male counterparts. The women represented in this review have mostly completed their formal educations and have made the decision to pursue academic careers in science and engineering.

Summary of Findings

Taken as a whole, the body of literature we reviewed provides evidence that women in academic careers are disadvantaged compared with men in similar careers. Women faculty earn less, are promoted less frequently to senior academic ranks, and publish less frequently than their male counterparts.

Earnings

The literature on the gender earnings gap in academia is extensive. Most of the studies we reviewed show that women faculty earn less than their male counterparts do, even after controlling for other factors that affect earnings. The gender gap in earnings narrowed by the late 1970s, and several authors hypothesize that this was the result of affirmative action policies implemented in the early 1970s.

The estimated size of the earnings gap appears to be sensitive to the kinds of control variables used in various studies. Studies that control for academic rank, publications, and family characteristics tend to show smaller earnings gaps than those that do not. However, evidence on the direct and indirect effects of marital status and parental variables on the earnings gap is mixed.

Academic Rank

There is substantial evidence that women, as a group, are underrepresented in senior academic ranks. In part, this is because women faculty tend to be younger than their male counterparts, a consequence of the relative increase in the number of women graduates entering the fields of science and engineering.[1] Many of the studies we reviewed, however, show that even after controlling for other factors affecting promotions, including experience, women are less likely to appear in senior ranks. Some studies provide evidence that women are particularly disadvantaged early in their careers, during child-rearing years.

Scholarly Productivity

Many researchers use measures of scholarly productivity as control variables in both salary and academic-rank studies. Scholarly production is typically a significant factor in determining earnings and promotions, and many authors noted that women faculty members publish less on average than their male counterparts do.[2] Thus, gender differences in publication rates explain, at least partially, differences in average earnings and promotion rates between women and men. One study, however, which used a quality-weighted index of scholarly output, found that female economists are more productive than their male counterparts are.[3] Also, some of the gender differences in productivity might be explained by job selection and gender sorting by coauthors. Men and women tend to collaborate with coauthors of the same sex. Because there are relatively few women in faculties, women are placed at a disadvantage because it is more difficult for them to find collaborators.

Organization of Report

Sections 2 through 5 of this report deal with background issues, findings on the gender earnings gap in academia, the effects of gender on tenure status and academic rank, and the literature on gender differences in scholarly productivity. Section 2, on background issues, provides a context for interpreting the findings in the literature. The last three sections of this review are connected by a common theme. Findings in the literature indicate that the gender earnings gap is at least partly due to gender differences in promotions and scholarly productivity.

[1]See, for example, Everett et al. (1996), Carnegie Foundation (1990), and Heylin (1989). Women faculty would also be younger than men if lower tenure rates cause higher female exit rates from academia.

[2]See, for example, Cole and Singer (1991).

[3]See Koplin and Singell (1996).